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MINK RAISING 1/

Prepared in the Section of Fur Resources, Division of Wildlife Research

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INTRODUCTIONHistory

Raising minks in captivity for their fur dates back in the United States to 1866. The degree of interest in the enterprise was for a time dependent more upon the pressure applied by promoters than upon the prices received for the skins. In later years, however, the accumulated knowledge of proper methods of breeding, feeding, and management has put operations on a sounder basis because of the greater number of minks that can be produced and saved to pelting time, the improved quality of pelts, and the lower costs resulting therefrom. The first ranch-raised mink skins were of a decidedly inferior quality, but at the present time (1941) the average quality of skins produced on farms is superior to that of skins

1/ This leaflet supersedes Wildlife Research and Management Leaflet BS-82, issued in January 1937 by the Bureau of Biological Survey, under the Department of Agriculture.

taken in the wild. This is to be expected, because observant and efficient mink raisers can improve the quality of their animals by controlled selective matings, proper and regular feeding, and intelligent management.

Mink skins are a quality fur now used primarily for coats, capes, and trimmings. Prosperous times are conducive to increased utilization, and new uses will expand the market. The diminishing wild supply makes it imperative that increased numbers of skins be supplied from mink ranches.

Basic Considerations

It is estimated that about 400,000 ranch-raised mink skins were produced in the United States in 1940. An item was included in the 1940 census to obtain the number of breeding animals and the number of kits produced in 1939. The summarization of this material has not been completed. Naturally there will be a constantly increasing number of mink raisers so long as a good profit can be derived from the enterprise. The history of all business undertakings demonstrates that eventually the number of persons interested reaches the point where a certain percentage who are inefficient invariably produce at a loss, but there is always a good market for high-quality goods. Mink raising is no exception. A person who contemplates entering the business should keep definitely in mind that quick riches are not to be found in it, and that though it might look most promising (always the case with new industries), the permanent basis is found only in the market skin produced under constantly increased and keener competition. (See Wildlife Leaflet BS-69, Fur Farming in Perspective.^{2/}) Good judgment dictates, therefore, that a person should begin raising minks only if he is determined to make the undertaking permanent on the basis of profitable pelts.

Certain other fundamentals must be borne in mind. In the United States most of the ranch-raised minks are produced either in the northern half of the country or elsewhere at high altitudes, the colder climates apparently tending toward a better development of fur. Until more definite information is obtained it might be advisable for the beginner to be guided by this general tendency.

Some States require licenses for raising fur animals in captivity. Information on this matter can be obtained from the State game commissions. Some towns have restrictive ordinances.

Minks do not require running water in which to swim; in fact, many mink raisers believe it to be harmful to the production of good pelts. Mink pens need not be large. As raw meat and packing house byproducts, or these and fish or fish scraps, should constitute more than 50 percent of the mink ration, a cheap source of supply should be available.

^{2/} The leaflets herein mentioned may be obtained free from the Fish and Wildlife Service, Department of the Interior, Washington, D. C.

If after due consideration these general points have been satisfactorily determined, the prospective mink raiser can then consider the details of mink raising.

PHYSICAL PLANT

Individual Pens

Many types of pens are in use and have proved satisfactory. It is best to provide a pen for each breeding animal, male or female. Individual pens can be made by shaping 16-gage, 1-inch mesh, woven wire, galvanized after weaving, into boxlike enclosures 4 feet long, 1-1/2 feet wide, and 14 to 18 inches high; wire ends are added, and a hole is cut in one end to allow access to the nest box, which is hung securely on the outside. An opening in the top of the pen may be provided for convenience in feeding or catching the animals. All openings should be properly reinforced with wooden strips on the outside. All rough twisted ends of the wire should also be on the outside. The pen may be attached by means of staples to four legs, or stakes, driven into the ground. Thus it can easily be lowered and kept on the ground from 1 week before to 3 weeks after whelping, so that the young will not fall through the wire and die. At other times, the pen is elevated 6 inches or more for sanitary reasons. Tubular wire pens of approximately the same dimensions have also been used.

Colony Houses

Colony houses or sheds, each with a 5-foot escape-proof alley, have given good results at the United States Fur Animal Experiment Station maintained by the Fish and Wildlife Service at Saratoga Springs, N. Y. About 160 individual pens are in each colony house. These pens, which have a solid wooden partition made from 1-inch planed shiplap, are approximately 5 feet long, 1-1/2 feet wide, and 14 inches high. The floor, top, and outside end are made of 16-gage, 1-inch hexagonal-mesh wire, galvanized after weaving, and the floors are approximately 2 feet above the ground. About half of each pen extends beyond the roof of the colony house to provide sunshine for the health and sanitation of the breeding stock. Artificial shade when needed may be provided by roofing paper. A wire-hinged lid for that part of each pen under the roof facilitates watering, feeding, or when necessary, catching the minks. If the partitions of the pens are made of wire instead of shiplap, they should be double and about 4 inches apart to prevent the animals from fighting through the wire. The end part of the pen under the roof is made of lumber to provide a place for hanging nest boxes. A hole 3-1/2 inches square is made about 5 inches from the floor as an entrance to the nest box. The edges are covered with metal to prevent the minks from chewing the wood and the rough edges from rubbing the fur. A metal slide for confining the minks to the nest box when desired and a solid temporary floor for these elevated pens during the first 4 weeks after whelping should be provided.

Nest Boxes

A wooden nest box that has proved satisfactory at the Fur Animal Experiment Station for the colony-type house is 10 inches square and 18 inches deep, with the entrance 11 inches from the bottom. This depth prevents the young minks from crawling out before they can take care of themselves. An inner removable lid to the nest box is made of wire on a wooden frame. This is fastened down with metal turn buttons. The solid outer lid is fitted so as to leave a ventilation space on each side. The darkness thus provided gives seclusion to the minks. These nest boxes rest on a 1 by 2 strip at the required height and are hooked to the sheltered end of the pen.

A commonly used type of outdoor nest box has a gable roof with entrances at the peak at each end. One side of the roof is hinged at each end by means of a small triangular piece of galvanized sheet iron attached at the gable edge of the movable side by two nails and to the edge of the stationary side by one nail near the extreme point of the metal. This permits half the roof to be lifted for putting in bedding or for examining the animals. The body of this nest box is about 10 inches square and 16 inches deep. It is set inside the individual outdoor pens and may be laid on its side to make it easier for the young minks to enter.

Other Equipment

An elevated wooden feeding table or a 6-inch aluminum pan should be securely fastened inside the pen. Fresh drinking water should be available, and this can be most easily provided by so designing the drinking pan or the opening that the animal cannot get into the water. The details of a sanitary drinking fountain for summer use are described in Wildlife Leaflet BS-40, An Automatic Drinking Fountain for Minks.

A cage or metal box 5 inches square and about 18 inches long made of 1/2-inch-mesh hardware cloth is useful in confining a mink so as to permit a more careful examination of the fur. A sliding metal end and a substantial handle should be provided for ease in confining and carrying the animal. A net with a long, wooden handle will be handy for recapturing any minks that may get loose in the alleyway.

SELECTION OF STOCK

The original stock should be purchased from some good, reliable breeder. The Department of the Interior does not maintain a list of breeders, but names and addresses may be obtained from State, regional, or national fur farmers' organizations, a list of which is contained in leaflet 3-1357. Furthermore, the Department does not furnish information as to the integrity or financial standing of any individual or concern.

In the selection of stock, besides knowing the individuality of the animals, particular attention should be given to an adult's past breeding performance, or in the case of a kit, to the prolificacy of the parents, and to constitutional vigor and freedom from disease. Most satisfactory results will be attained by the beginner if one male is bought for every two females. Later it may be found that fewer males are needed. Good, selected breeding stock will cost two to three times the value of the pelt it carries. It will pay to invest only in high-class animals.

There is much controversy on the qualities of the various strains of minks. The two most common strains are the Yukon and the Eastern. The Yukon is considered a large, prolific mink, and the fur is rather coarse and long except on animals raised on ranches where these characteristics have been modified by selective breeding. The Eastern mink has a thinner skin and fur of a slightly better quality, but does not breed so readily as the Yukon. Male minks are much larger than females. Fine-quality animals with a thin skin and dense fur of a dark-chocolate color, the underfur having a blue-black appearance next to the skin, are desired. Pelts having underfur about five-eighths of an inch long and guard hair approximately half again as long are the most valuable on the market. All these points can best be judged in fall, just before pelting time. Beginners in mink raising will do well to depend upon the judgment of reliable, experienced mink ranchers in selecting the best type of animals. Much valuable information can be obtained by visiting some of the best ranches and raw-fur houses making a specialty of mink skins and by attending live-mink and pelt shows and fur-auction sales.

FEEDS AND FEEDING

Preparing Rations

Minks should be fed on a diet of raw meat, dry mixture, ground green bone or bonemeal, ground vegetables, water, and salt. From 50 to 70 percent of the ration, depending upon the season of the year, should consist of muscle meat (2 parts) and viscera (1 part) of horse, cow, or sheep. The viscera may be heart, liver, lungs, kidneys, spleen, or brains in varying proportions. A variety is desirable. Some tripe can be fed in summer and fall. Whole fresh-ground fish or canned fish may be substituted for 50 percent of the raw meat. Contaminated fish or meat should never be used. Chicken or rabbit heads or rabbit carcasses can be used if fresh. (See also Wildlife Leaflet BS-112, Tankage and Livermeal as a Summer Feed for Adult Minks.)

If the meat is ground it can be readily mixed with other parts of the ration, and this will also prevent the minks from carrying large portions into the nest box or wasting it. Proper refrigeration should be available on the ranch or in nearby cities for preserving quantities of meat and feed.

The following is a satisfactory dry mixture:

	<u>Pounds</u>		<u>Pounds</u>
Breadmeal (whole wheat)	100	Alfalfa-leaf meal	50
Oatmeal	100	Soybean meal (expeller)	50
Wheat-germ meal	100	Linseed-oil meal	25
Fish meal (vacuum dried)	100	Wheat bran	25
Skim-milk powder	50	Yeast (inactive)	25
		Total	625

Byproducts of cereal-food manufacturing companies, if procurable at a reasonable price, are desirable. The dry mixture should constitute 10 to 20 percent of the ration; the ground green bone should form 5 percent (or bonemeal, 1 percent); and such ground vegetables as tomatoes, carrots, turnips, and green lettuce, 5 to 10 percent. Add salt to the extent of about one-half of 1 percent of the ration as fed. The remainder should be water or clean, fresh milk, sufficient to make the entire ration of hamburger consistency. As a precautionary measure three-tenths of 1 percent of fortified cod-liver oil should be added to the ration of the female from breeding to weaning time. Very little experimental work has been done on feeding minks (see Wildlife Leaflet 168, The Digestibility of Animal Products and Cereals by Minks), so it is not definitely known to what degree desiccated packing-house products and other protein meals can replace the raw meat. A modified ration for animals to be pelted is discussed on page 8.

Daily Schedule

The quantity to be fed each mature mink daily will vary from 5 to 9 ounces, depending upon individual and sex. The animals should be kept thrifty but not overly fat. One feeding a day in the evening is sufficient for mature minks except during lactation, when two a day are desirable. A female will eat very little a day or so before and after whelping. Young growing minks should be fed twice a day and will readily eat more than mature minks. When fed twice a day, about one-third of the daily food allowed is given at 8 a.m. and two-thirds at 4 p.m. It is desirable to collect rejected food a few hours after feeding.

Many extensive breeders have adopted the practice of feeding on the wire above a feeding table or in winter on the wire above the nest box. This, of course, can be done only if the feed is of the right consistency. These producers consider that no more food is lost in the nest box by feeding above the wire than would occur when the mink runs to the nest box with a large mouthful. The nest box should not be allowed to become contaminated with food. Poorly or sick minks should receive special consideration in the way of choice rations of meat, milk, or raw eggs at the rate of one egg to 5 minks. Young orphan minks may be suckled by a cat or fed a good mixed porridge with whole milk.

BREEDING

Mating

The mating season in the mink occurs principally during March. Eastern minks breed about 10 days earlier than Yukons. The oestrus, or heat period, occurs once a year, but its length is not definitely known. A good rancher can tell by the actions of the female when this period is approaching, which is about the first of March.

Males and females should not be placed together until it is certain that both are in full breeding condition. No date can be set for seasons because animals vary in this respect. Experience has shown that when either animal is not ready, many early matings will be unproductive. Even though copulation takes place, the eggs may not be well enough developed to be fertilized, or the male may not have mature sperms. In the latter case pseudopregnancy may result. It is easier to obtain matings without the risk of fighting and injury if the season is well advanced. The chances of drawing a blank are thus reduced.

The mink can be caught in the nest box or in a special catching box and carried to the desired pen. An aggressive male will pursue his mate and attempt service if she is in heat. If in heat she will not strongly resist, but if a fight ensues the pair should be separated and a retrial made later. A service may last 30 to 40 minutes or even longer.

Every mating should be checked for living sperms by a vaginal smear after the animals have separated. The materials and methods used are listed and explained in Wildlife Leaflet BS-138, Sperm Studies as a Guide in Fur-animal Breeding Practice. If no sperms are present, the female should be placed with another male. If copulation results, another vaginal smear should be taken. The eggs, in all probability, will have been stimulated by the first mating. They will mature, but without sperms they cannot be fertilized. Therefore, every reasonable attempt to obtain matings should now be made. Since the eggs will not be released from the ovary for about 48 hours after the first copulation, sperms deposited as late as the day after should be effective.

Another attempt should be made the next day to breed a female that has copulated. This should insure that plenty of fresh sperms will be waiting for the eggs as they emerge from the ovary. The usual practice of breeding 4, 5, or 6 days after the first copulation is justified, probably, by the impregnation of the few females that did not ovulate at the first breeding. Some females will not breed again, but this is not proof that they are pregnant. Kits should not be mated with pugnacious older animals. See Wildlife Leaflets BS-138, Sperm Studies as a Guide in Fur-animal Breeding Practice, and 169, Mink Breeding--Elementary Principles.

Care of Young

A record should be made of the breeding date. The gestation period extends 45 to 60 days. The mewing of the kittens will indicate that whelping has occurred. From 4 to 10 kittens are born to a litter. Unless something unforeseen develops they should not be disturbed for a week or so, though the experience of the rancher and his knowledge of the individual animal should be the final deciding factor in that matter. The young minks grow rapidly and when they are about 3 weeks old will begin eating their mother's ration, which she carries to them. They will come out of the nest box when 4 or 5 weeks old and should be weaned at 7 or 8 weeks of age. Litter mates of one sex may be kept for a few weeks in the same pen if it is large enough. An average of four weaned minks for every adult female on the farm is a satisfactory proportion. Some females, of course, do not breed, and others lose their litters.

HINTS ON MANAGEMENT

Keeping records is most important to good management in the minkery. Recorded information will assist in selecting breeders and in making the desired matings for improvement. An identification tag should be on every pen and should be transferred to the new quarters when the mink is moved. Nest boxes should always be kept dry by frequent regular changes of the fine absorbent bedding. The last cleaning of the nest box before whelping should not be later than 10 days before that event. The bedding should be changed more frequently when it is full of partly grown minks. Careful management, based upon a knowledge of the characteristics of individual animals is necessary for the greatest success in mink raising.

SANITATION

Sanitation is essential for profitable mink raising because it is largely responsible for the health and well-being of the stock. Regular, frequent, and thorough cleaning of pens and nest boxes is highly important in controlling insects and parasites. The free use of a good disinfectant assists materially in controlling parasites and outbreaks or spread of disease. Clean feeding rooms and dishes help prevent digestive disturbances. Precaution in all these matters will be highly profitable. Further information of value to mink raisers is contained in Department of Agriculture Leaflet No. 47, Hygiene in Fox Farming, and Farmers' Bulletin 1777, Diseases of Fur Animals, both of which may be obtained free, so long as the supply lasts, from the Office of Information, Department of Agriculture.

ANIMALS TO BE PELTED

Some time during August animals to be pelted should be put into individual pens entirely protected from sunlight. Some of the more successful mink farmers have provided suitable furring pens by bending woven wire to form oblong enclosures somewhat smaller than the individual breeding

pen, placing these on two logs to raise them about 6 to 8 inches off the ground, and then covering the entire row with tar paper. After pelting, the pens can be stacked and the premises cleaned and disinfected.

It is considered desirable to reduce the percentage of muscle meat in the ration for animals to be pelted and substitute tripe and other non-glandular organs. The proportion of dry mixture should be increased.

The time of pelting varies with locality and season but is usually between November 15 and December 10. The fur then appears to be full of life, glossy and dense, and completely grown out. The full prime condition of the pelt may be determined by catching the animal and blowing into the fur. The exposed skin then has a creamy-white appearance.

PELTING OPERATIONS

Killing

There are several methods of killing minks, but most of them are based upon the principle of confinement in a small, airtight box having a small hole through which can be introduced some kind of lethal gas, as carbon monoxide from the exhaust of a car, cyanogas, chloroform, or carbon tetrachloride. If the gas from the exhaust of a car is used, provision should be made to guard against the hot fumes striking the animal and singeing the fur.

Skinning

The mink is most easily skinned while the body is still warm but some ranchers prefer to delay skinning about one hour until the fat hardens. A table of proper height equipped with devices to aid in holding the carcass should be used. Some commercial ranchers stretch the hind feet apart fairly tightly and slit the skin from the pad of one foot straight across to the same part of the other. Another long, diagonal cut is made on both sides from the under base of the tail to the original cut. Though this procedure leaves a small triangular-shaped piece of skin on the carcass, it provides an exposed part of the rump of the skin for convenience in examining the fur, since mink skins are sold with the fur side in. A slit is made from the pad up the back of the front leg about 1 inch. The skin is worked free from around all four legs and then cut loose from the carcass just above the feet. A short slit is made along the under base of the tail so that, after freeing the skin from the top of the tail with the fingers, the bone can be easily pulled out with the assistance of a board or iron having a notch of the proper width. The carcass is then hung on a hook or nail by the tendon of the hock joint, and the pelt is pulled down, the knife being used whenever necessary to free it, until it is removed as far as the neck. Careful work is then necessary to cut around the base of the ears, including them on the pelt, around the eyes, and around the mouth and lips. The tail is finally slit on the under side along its entire length.

The pelt should be kept as free as possible from blood, grease, and dirt during these operations. All loose fat and flesh should be removed.

Scraping and Drying

Before scraping, some breeders put the pelt on a drying board and chill in a refrigerator or in a suitable utensil surrounded by ice and salt, or set it aside overnight. The fat will be hardened and, therefore, will be much more easily removed. Scraping may be done with a special instrument purchased for this purpose, a dull knife, or even a large spoon, the skin having first been slipped over a stationary board of the proper size and rounded on the top side, and set at the desired angle for satisfactory work. Scraping is a most important operation. Too close scraping exposes the roots of guard hairs and fur and causes them to come out. It is much better not to scrape enough than to overscrape. The proper technique can be acquired only by experience, consulting successful breeders, and discussing this point with those who have previously used some of your own dressed skins.

The pelt is finally pulled fur side in over a special board for drying. Boards of the proper size and shape can be obtained from supply houses. Do not overstretch the skin as this tends to make it flat in fur and more open in appearance. Tack it to the board and set aside to dry away from stove and open blaze.

USEFUL PUBLICATIONS

Mink farming on a commercial scale is of such recent growth that new and better methods of feeding, breeding, and management are being continually developed through research and in practice on fur farms. Many bits of information along these lines are to be found in fur-farming journals, to one or more of which every mink raiser would do well to subscribe. Undoubtedly the publishers would be glad to send sample copies upon request. A partial list of such publications with the addresses and annual subscription prices follows:

- American Fur Breeder, 333 W. Superior Street, Duluth, Minn. \$1.
- American National Fur and Market Journal, Wausau, Wis. \$2.
- Black Fox Magazine, 425 Fourth Avenue, New York, N. Y. \$2.
- Canadian Silver Fox and Fur, 184 Adelaide Street, W. Toronto, Canada. \$1.
- Fur Journal, 72 Columbia Street, Seattle, Wash. \$1.
- Fur of Canada, McIntyre Building, Winnipeg, Canada. \$1.
- Fur Trade Journal of Canada, Box 31, Toronto, Canada. \$1.
- National Fur News, 444 Seventeenth Street, Denver, Colo. \$1.